

### Abstract

The invention is a method and computer application, implemented as a computer program, for modifying the shape of free-form Computer Aided Design (CAD) curves and surfaces to eliminate bad gap problems from CAD databases. The change of shape invention is based on an optimization algorithm that modifies a free-form shape to minimize its connectivity gaps while being constrained to minimize any changes in initial shape. The invention can be used to eliminate bad connectivity gaps, tangency gaps, curvature gaps, and gaps based on higher order differential properties. The invention can be used to modify any free-form curve or surface shape that is represented as a linear sum of basis functions. This class of functions includes but is not limited to B-splines, NURBS, and Hermite polynomials.